

Appl. No. 09/771,277
Amdt. dated July 3, 2003
Reply to Office Action. of May 2, 2003

REMARKS

This Amendment is submitted in response to the Office Action mailed May 2, 2003. At that time, claims 1-50 were pending in the application. In the Office Action, the Examiner indicated that claim 27 contained allowable subject matter. However, claims 1-6, 11, 12, 17-19, 24-26, 29-31, 34-36, and 38-40 were rejected under 35 U.S.C. §102(b) as anticipated by the article written by Beale and Sundmeier (hereinafter "Beale"). Claims 1, 3-6, and 15 were rejected under §102(b) as being anticipated by U.S. Patent No. 5,338,427 to Shartle et al (hereinafter "Shartle"). Claims 15, 33, and 41-46 were rejected under 35 U.S.C. §103(a) as being unpatenable over Beale in view of Shartle. Claims 1-22, 24-26, and 29-50 were rejected under §103(a) as being unpatenable over the article written by Hanning et al (hereinafter "Hanning") in view of Beale. Claim 23 was rejected under §103(a) as being unpatenable over Hanning in view of Beale and in further view of the article written by Li et al (hereinafter "Li"). Claim 28 was rejected under §103(a) as being unpatenable over Beale in view of the article written by Kim et al (hereinafter "Kim"). Claims 16-18, 34-37, and 49 were further rejected under 35 U.S.C. §112.

By this amendment, claims 1, 7-10, 16, 19, 20, 34, 36, 40, 41, and 47-49 have been amended and a substitute drawing has been submitted. Accordingly, claims 1-50 are presented for reconsideration by the Examiner.

AMENDMENT TO THE DRAWINGS

Figure 2 has been amended to correct for errors in the reference numbers. Figure 2 had erroneously omitted reference number 154 that corresponds to the computer. By this amendment, a new Figure 2 has been submitted in which the computer of Figure 2 is appropriately labeled with reference number 154.

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REJECTION OF CLAIMS 16-18, 34-37, AND 49 UNDER 35 U.S.C. §112

The Examiner rejected claim 16-18 and 34-37 under 35 U.S.C. §112 on grounds that these claims contained an improper Markush group. *See* Office Action page 2. Claim 49 was also rejected under §112 on grounds that the use of the trademark TEFLON AF in claim 49 was improper. *See id.* By this paper, these claims 16, 34, and 49 have been amended to address these issues. Accordingly, the Applicants respectfully request that this §112 rejection be withdrawn.

REJECTION OF CLAIMS 1-6, 11, 12, 17-19, 24-26, 29-31, 34-36, AND 38-40 UNDER 35 U.S.C. §102(b)

The Examiner rejected claims 1-6, 11, 12, 17-19, 24-26, 29-31, 34-36, and 38-40 under 35 U.S.C. §102(b) as being anticipated by Beale. *See* Office Action page 3. The Applicants respectfully traverse this rejection.

It is well settled that a claim is anticipated under 35 U.S.C. §102(b) only if “each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); *see also* MPEP §2131. As a result of this paper, claims 1-6, 11, 12, 17-19, 24-26, 29-31, 34-36, and 38-40 include the limitation that the capillary have a coating that transforms the capillary into a light wave guide. Such a limitation is not taught or disclosed by Beale and as such, Beale does not anticipate these claims under §102(b). Withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIMS 1, 3-6, AND 15 UNDER 35 U.S.C. §102(b)

The Examiner rejected claims 1, 3-6, and 15 under §102(b) as being anticipated by Shartle. *See* Office Action page 5. The Applicants respectfully traverse this rejection.

As noted above, anticipation under §102(b) requires that each and every claim limitation be disclosed by the prior art reference. *See* MPEP §2131. As a result of this paper, claims 1, 3-

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6, and 15 include the limitation that the capillary have a coating that transforms the capillary into a light wave guide. Shartle does not teach or disclose this limitation. As such, Shartle does not anticipate these claims under §102(b). The Applicants respectfully request that this rejection be withdrawn.

REJECTION OF CLAIMS 15, 33, AND 41-46 UNDER 35 U.S.C. §103(a)

The Examiner rejected claims 15, 33, and 41-46 under 35 U.S.C. §103(a) as being unpatenable over Beale in view of Shartle. *See* Office Action page 7. The Applicants respectfully traverse this rejection.

“To establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” MPEP §2143.03. As a result of this paper, claims 15, 33, and 41-46 include the limitation that the capillary have a coating that transforms the capillary into a light wave guide. As noted above, this limitation is not taught or disclosed by either Beale or Shartle. Therefore, the combination of Beale and Shartle does not render these claims *prima facie* obvious under §103(a). Withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIMS 1-22, 24-26, AND 29-50 UNDER 35 U.S.C. §103(a)

The Examiner rejected claims 1-22, 24-26, and 29-50 under 35 U.S.C. §103(a) as being unpatentable over Hanning in view of Beale. *See* Office Action page 7. The Applicants respectfully traverse this rejection on grounds that these references are not properly combinable under §103(a).

A Prima Facie Case of Obviousness Has Not Been Made

The Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness. It is well settled that the PTO has the burden to establish a *prima facie* case

of obviousness. MPEP §2142. “If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.” *Id.* A *prima facie* case of obviousness is established only if the Examiner shows that (1) there is some teaching, suggestion, or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there is a reasonable expectation of success; and (3) the prior art teaches or suggests all of the claim limitations. *See id.*

1. There is No Teaching Or Motivation To Combine Hanning and Beale

The mere fact that references can be combined or modified does not render the resultant combination obvious unless there is some teaching that suggests the desirability of the combination. *See e.g., In re Mills*, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990). In other words, even if all of the claimed elements are disclosed by the references, the claimed invention cannot be said to be obvious without some objective evidence of record that indicates why one of ordinary skill in the art would have been prompted to combine the teachings of the references and arrive at the claimed invention. *See* MPEP §2143.01; *In re Lee*, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

In the present case, Beale teaches a method for detecting fluorescent emissions in capillary electrophoresis systems by using a confocal microscope that scans the length of the capillary. *See* Beale, page 3367. Such a detection system is based upon and employs the scanning confocal microscope system taught by “Mathias and co-workers for continuously monitoring the outlet ends of several capillaries in a bundle.” *Id.*

Hanning, on the other hand, does not teach anything related to a scanning confocal microscope; rather, Hanning teaches a system that collects the emitted fluorescent light by having the “capillary act[] as a liquid core waveguide.” Hanning, page 3424. This difference is critically important because according to Hanning, detectors using a scanning confocal microscope such as those taught by Mathias are limited and inadequate. *Id.* at page 3423. More

specifically, scanning confocal microscope detectors have “certain drawbacks[] such as the need for scanning optics and the critical alignment and positioning due to the shallow focal depth of the objective.” *Id.* In fact, it was these drawbacks, as well as the limitations associated with other known detectors, that led the researchers in Hanning to develop their detection system in the first place. *Id.* at page 3424.

Accordingly, as Hanning dismisses Beale’s scanning confocal microscope system as being inadequate and limited, the Applicants, submit that there is no teaching that would have led one of ordinary skill to combine Hanning and Beale. As such, this combination of references may not be used to reject the present claims under §103(a). Withdrawal of this rejection is respectfully requested.

2. Hanning and Beale Teach Away From Their Combination

Perhaps more importantly, the Applicants submit there can be no finding of *prima facie* obviousness because Hanning directly teaches away from a combination with Beale. It is well established that if the references themselves teach away from their combination, then such teaching away by itself defeats any assertion of *prima facie* obviousness. *See Winner International Royalty Corp. v. Wang*, 53 USPQ2d 1580, 1587 (Fed. Cir. 2000); *In re Grasselli*, 218 USPQ 769, 779 (Fed. Cir. 1983); MPEP §2146.

Hanning teaches a system in which the emitted fluorescent light is collected and detected by a process known “total internal reflection.” Hanning, page 3424. Such total internal reflection occurs by externally coating the capillary with a polymer such as TEFLON. *See id.* Specifically, when the sample emits fluorescent light, the polymer coating on the capillary causes all of the light to reflect back within the capillary. *See id.* This internal reflection of the light directs the light such that the light moves along the longitudinal length of the capillary until it reaches the capillary’s end. *See id.* Once at the end, this emitted light may then be directed through optics and detected by an optical sensor such as a CCD camera. *See id.* at page 3424-3425. The most important part of this detection system is the polymer coating because, as noted

by Hanning, if the coating is not added, total internal reflection will not occur and “most of the fluorescent light [will]... be radially decoupled and escape into the buffer vessel.” *Id* at 3424.

Conversely in Beale’s system, once the fluorescent light is emitted by the sample, the fluorescent light is reflected back 180° such that it leaves the capillary. *See* Beale, page 3367; Figure 1. Once out of the capillary, this reflected fluorescent light is then collected by the same microscope objective that was used to impart the laser light onto the capillary. *See* Beale, page 3367. After this light has been appropriately collected by the objective, the emitted light is then directed through filters and other optics until it is detected by a photomultiplier tube. *See id* at 3367.

Moreover, Beale further teaches that in order for the emitted fluorescent light to be properly reflected back out of the capillary, the capillary should be “stripped of the polyimide [*i.e.* polymer] coating using either a butane flame or fuming sulfuric acid....” *Id* at page 3368. The purpose for removing the polymer coating is that these coatings “tend[] to vary in thickness” and as a result, they raise the background noise of the system. *Id.* The Applicants assert that the reason that these coatings raise the background noise is that these differences in coating thickness cause the emitted light to reflect out of the capillary in a non-uniform manner.

Given these conflicting disclosures, the Applicants submit that Hanning and Beale teach away from their combination. Specifically, Hanning’s teaching that the emitted fluorescent light be totally internally reflected within the capillary is incompatible with and directly teaches away from a combination with Beale system that requires that the fluorescent light be reflected back 180° out of the capillary. Additionally, Hanning’s teaching that the capillary include an external polymer coating contradicts and directly teaches away from Beale’s system that teaches that the polymer coating should be stripped off of the capillary in order to reduce the background noise. Such teaching away defeats, by itself, any claim or assertion of *prima facie* obviousness and as such, the Applicants respectfully request that this obviousness rejection be withdrawn.

3. The Combination Would Change Hanning's Principle of Operation

The Applicants also submit that combining Hanning with Beale in the manner suggested by the Examiner is improper because it would require changing Hanning's principle of operation. It is well established that if "the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious" under §103(a). MPEP §2143.01 (citing *In re Ratti*, 123 USPQ 349 (CCPA 1959)).

As noted above, Hanning operates by having the capillary include an external polymer coating that causes total internal reflection of the emitted fluorescent light. *See* Hanning, page 3424. If Hanning were combined with the Beale, the Applicants submits that this principle of operation would likely have to be changed in order to accommodate Beale's system which teaches that the polymer coating be removed and that the emitted fluorescent light be reflected back 180° out of the capillary. *See* Beale, page 3367-3368. As a result, the proposed combination of Hanning with Beale is improper and does not render the Applicants' claims *prima facie* obvious under §103(a). Withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIM 23 UNDER 35 U.S.C. §103(a)

The Examiner rejected claim 23 under §103(a) as being unpatenable over Hanning in view of Beale and in further view of the article written by Li. *See* Office Action page 9. This rejection is improper for the reasons mentioned above in connection with the proposed combination of Hanning and Beale. Additionally, the Applicants submit that the proposed combination is also improper because there is no teaching to combine Li with Hanning.

As described above in greater detail, Hanning teaches as system in which laser light is used as the excitation source to in order to induce fluorescence in the capillary tube. *See e.g.*, Hanning page 3424. In order to for such a system to properly induce fluorescence, Hanning teaches that the laser light must be "focused axially with respect to the capillary." *Id.* Li, on the

other hand, teaches a completely different system in which ultraviolet light is used as the excitation source. *See e.g.*, Li page 681. Such a difference is critically important because according to Li, systems in which laser light is axially added to the capillary are inadequate and limited. Specifically, such systems are limited in that they require "very effective means of rejection the excitation light" and use "laser sources ... [that] are expensive and can not provide excitation over a broad wavelength range." *Id.*

Therefore, because Li dismisses Hanning's system using an axially focused laser excitation source as being inadequate and limited, the Applicants submit that there is no teaching that would have led one of ordinary skill to combine Li and Hanning. Accordingly, this combination of reference is improper and cannot be used to reject the present claims under §103(a). Withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIM 28 UNDER 35 U.S.C. §103(a)

The Examiner rejected claim 28 under §103(a) as being unpatentable over Beale in view of Kim. *See* Office Action page 10. The Applicants respectfully traverse this rejection.

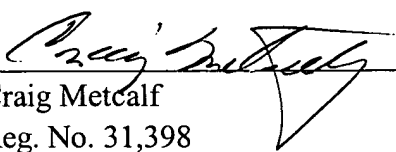
As noted above, a *prima facie* case of obviousness under §103(a) is not established unless all of the claim limitations are taught or suggested by the prior art. *See* MPEP §2143.03. Claim 28 includes the limitation that the capillary have a coating that transforms the capillary into a light wave guide. As noted above, this limitation is not taught or disclosed by Beale. Likewise Kim fails to teach or disclose anything related to a coating on the capillary, let alone a coating that transforms the capillary into a light wave guide. Accordingly, the combination of Beale and Kim does not disclose all of the limitations found in claim 28 and therefore, these references do not render claim 28 *prima facie* obvious. Withdrawal of this rejection is respectfully requested.

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CONCLUSION

In view of the foregoing, the Applicants submit that claims 1-50 are in a condition for immediate allowance. If there are any remaining issues preventing allowance of the pending claims that may be clarified by telephone, the Examiner is requested to call the undersigned.

Respectfully submitted,



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